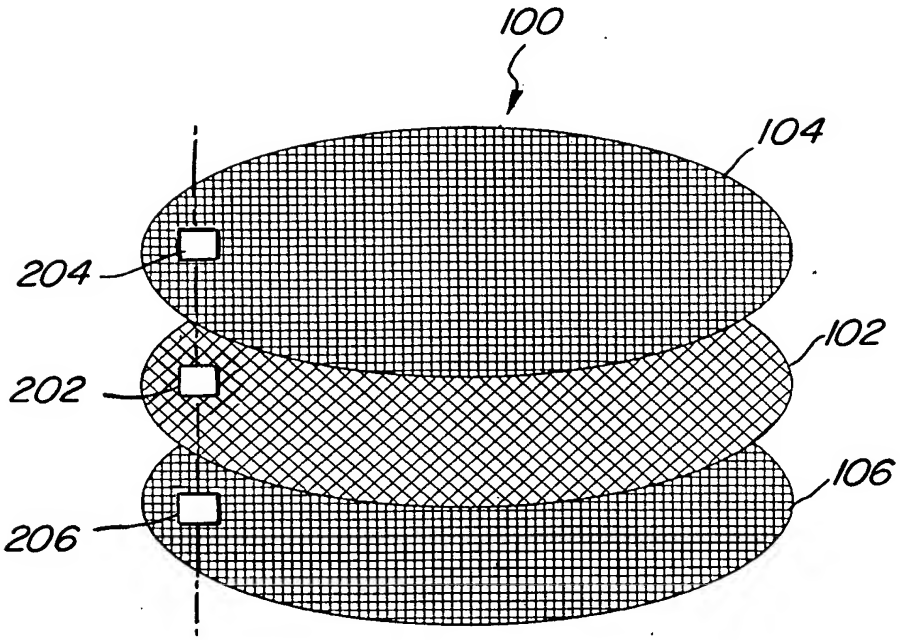


FIG. 1

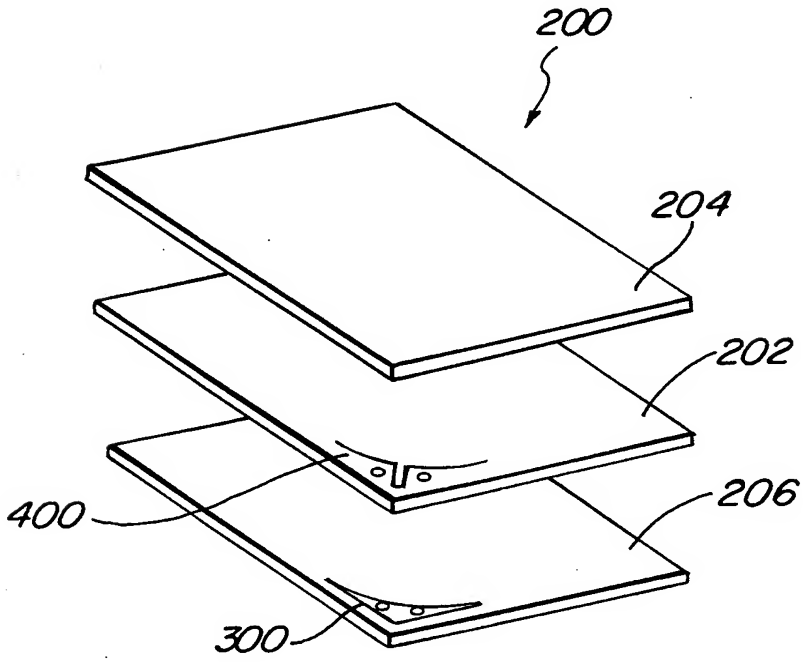


FIG. 2

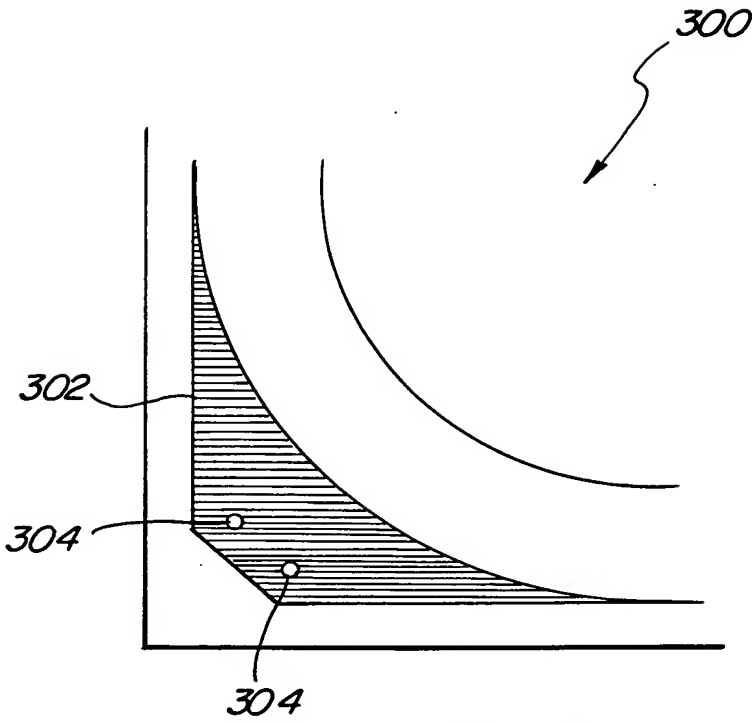


FIG. 3

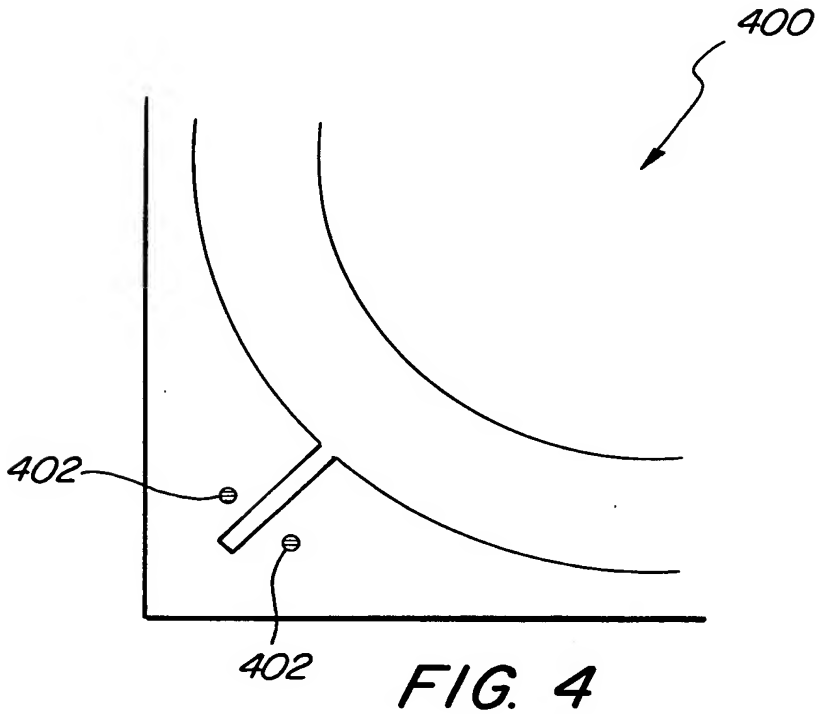
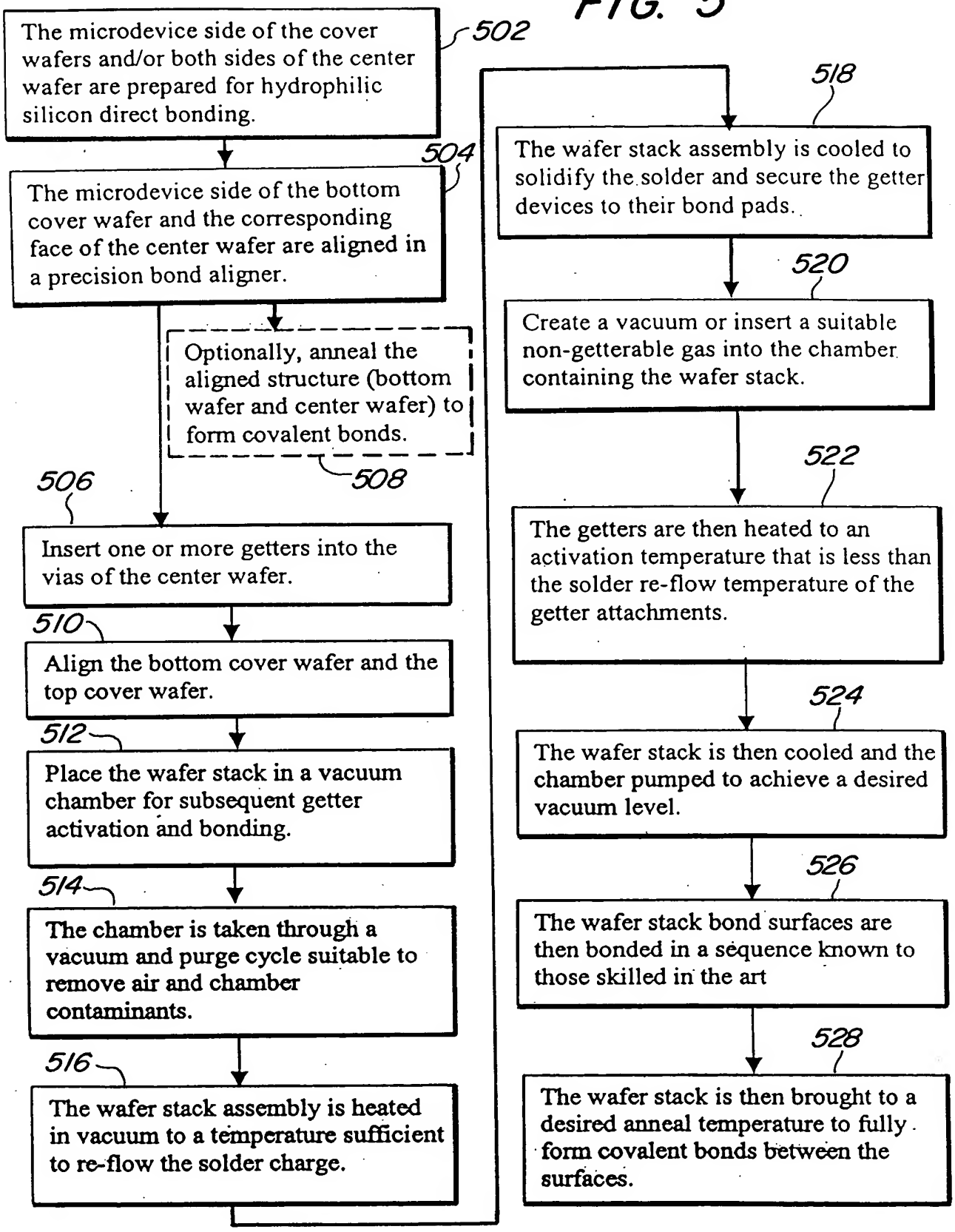


FIG. 4

FIG. 5


The microdevice side of the cover wafers and/or both sides of the center wafer are prepared for hydrophilic silicon direct bonding.
502
The microdevice side of the bottom cover wafer and the corresponding face of the center wafer are aligned in a precision bond aligner.
504
Optionally, anneal the aligned structure (bottom wafer and center wafer) to form covalent bonds.
508
506
Insert one or more getters into the vias of the center wafer.
510
Align the bottom cover wafer and the top cover wafer.
512
Place the wafer stack in a vacuum chamber for subsequent getter activation and bonding.
514
The chamber is taken through a vacuum and purge cycle suitable to remove air and chamber contaminants.
516
The wafer stack assembly is heated in vacuum to a temperature sufficient to re-flow the solder charge.
518
The wafer stack assembly is cooled to solidify the solder and secure the getter devices to their bond pads.
520
Create a vacuum or insert a suitable non-getterable gas into the chamber containing the wafer stack.
522
The getters are then heated to an activation temperature that is less than the solder re-flow temperature of the getter attachments.
524
The wafer stack is then cooled and the chamber pumped to achieve a desired vacuum level.
526
The wafer stack bond surfaces are then bonded in a sequence known to those skilled in the art
528
The wafer stack is then brought to a desired anneal temperature to fully form covalent bonds between the surfaces.